

Specification

Paragraph at page 6, line 26 - page 7, line 23

To achieve the desired low level of friction, ferrofluid bearings are preferably employed as an interface between the magnets and enclosure. Ferrofluids are dispersions of finely divided magnetic or magnetizable particles, generally ranging between about 30 and 150 Angstroms in size, and dispersed in a liquid carrier. The magnetic particles are typically covered with surfactants or a dispersing agent. The surfactants assure a permanent distance between the magnet particles to overcome the forces of attraction caused by Van der Waal forces and magnetic interaction, and also provide a chemical composition on the outer layer of the covered particles which is compatible with the liquid carrier and the chemicals in the surrounding environment. Ferrites and ferric oxides employed as magnet particles offer a number of physical and chemical properties to the ferrofluid, including saturation magnetization, viscosity, magnetic stability and chemical stability. Several types of ferrofluids are provided by Ferrotec (USA) Corporation of Nashua, New Hampshire. A summary of patents related to the preparation of ferrofluids is provided in Patent No. 6,056,889, while the use of ferrofluid bearings in a moving magnet electrical generator is discussed in copending Patent Application Serial No. 10/078,724, entitled "Electrical Generator With Ferrofluid Bearings", filed on the same day as parent application Serial No. 10/078,17 to the present ~~invention~~ application by the present applicants and ~~also~~ assigned to Innovative Technology Licensing, LLC, which subsequently changed its name to Rockwell Scientific Licensing, LLC, the assignee of the present

invention. The contents of this copending application are hereby incorporated herein by reference.

Paragraph at page 8, lines 10-29

A preferred ferrofluid composition for the present invention has a viscosity substantially less than 5 cp, actually less than 2 cp, and achieves an ultra low coefficient of static friction in the range of 0.0008-0.0012. This is sensitive enough for a magnet on a beam to begin sliding when the beam is tilted only about 0.07 degrees off horizontal. This and other suitable ferrofluid compositions are discussed in copending Patent Application Serial No. 10/078,132, entitled "Mechanical Translator With Ultra Low Friction Ferrofluid Bearings", filed on the same day as parent application Serial No. 10/078,176 to the present invention application by applicant Jeffrey T. Cheung, and ~~also~~ assigned to Innovative Technology Licensing, LLC, which subsequently changed its name to Rockwell Scientific Licensing, LLC, the assignee of the present invention, the contents of which application are hereby incorporated herein by reference. The composition comprises a mixture of one part Ferrotec (USA) Corporation EFH1 light mineral oil ferrofluid mixed with from two to four parts of isoparaffinic acid, stirred for 24 hours. Suitable sources of isoparaffinic acid are Isopar G and Isopar M hydrocarbon fluids from ExxonMobil Chemical Corp.

Paragraph at page 11, line 17 - page 12, line 9

FIG. 4 is a calculated plot illustrating the multiple modes of vibration that result from a plural magnet system with ultra low friction bearings. This plot was made with the magnets assumed to have equal magnetic field strengths, and traces the velocity of one of the

magnets as a function of time. The enclosure is assumed to have a length that would result in a natural frequency of 1 Hz for a single-magnet system. With two magnets there are multiple modes of oscillation, corresponding to the several velocity peaks which occur during each one second period, for each magnet. This makes the multiple magnet system more responsive to enclosure movements that do not match the system's natural frequency and/or are out-of-phase with the initial magnet movement. The increased responsiveness of multiple-magnet transducers with ultra low friction bearings is discussed in detail in copending Patent Application Serial No. 10/077,945, entitled "Multiple Magnetic Transducer", filed on the same day as parent application Serial No. 10/078,176 to the present ~~invention~~ application by the present applicants and ~~also~~ assigned to Innovative Technology Licensing, LLC, which subsequently changed its name to Rockwell Scientific Licensing, LLC, the contents of which application are hereby incorporated herein by reference. Similarly, multiple oscillation modes are produced with the multiple magnets of different field strengths which are the subject of the present invention.